

# Medical ward admissions among HIV-positive patients in Winnipeg, Canada, 2003–10

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**Summary:** Canadian data regarding the characteristics of HIV-positive patients admitted to hospital as well as the causes and patterns of admissions remain limited. Chart reviews were performed to ascertain admission diagnosis, co-morbidities and CD4 counts among this sub-population, which had an over-representation of Aboriginal persons. Infectious diseases, particularly pneumonia, represent the most common admission diagnosis for HIV-positive persons in Winnipeg. Further, individuals presenting to hospital often have very low CD4 counts, representing significant immune suppression. Earlier HIV diagnosis and treatment in an effort to delay the onset of advanced disease and hospitalization is needed.

**Keywords:** HIV, hospital admission, CD4 count, admission diagnosis, co-morbidities, Canada

## INTRODUCTION

Despite the use of combination antiretroviral therapy (cART) since the mid-1990s, hospital admissions remain common among HIV-positive persons.<sup>1,2</sup> The majority of individuals diagnosed with HIV infection in Manitoba (~95%) receive health care through the Manitoba HIV Program. In 2010, approximately 1000 HIV-positive individuals received health care at the two outpatient clinics affiliated with the Manitoba HIV Program, located in the capital city, Winnipeg, Canada. Upon first positive HIV test, 40–50% had AIDS-defining illness.<sup>3</sup> A 2008 chart audit revealed that nearly 45% of new HIV cases presented with CD4 counts below 200 cells/mm<sup>3</sup>, 60% of whom were Aboriginal.

The goal of this project was to describe the characteristics, admission diagnoses and co-morbidities of HIV-positive patients who were admitted to hospital in Winnipeg.

## METHODS

The Winnipeg Regional Health Authority Medical Database was used to identify all HIV-positive patients admitted to medical wards from October 2003 to May 2010 in four Winnipeg hospitals. Patient demographics, admission diagnoses, pre-existing co-morbidities, CD4 cell count, cART regimen, length of stay, complications and survival data were obtained through the Medical Database and supplemented with hospital chart reviews.

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## RESULTS

### Sample demographics

A total of 679 admissions for 307 individuals were identified, with an average of 2.2 admissions per patient throughout the six-and-a-half-year period (standard deviation [SD]=1.9), with a range of 1–14 admissions. Patients ranged in age from 18 to 72 years, with an average age of 41.9 (SD = 9.7), and 59% were men. Among those for which ethnicity information was available (22%), 62% were Aboriginal, 17% Caucasian and 13% African. Location of residence information was available for 10% of the sample and the most common location of residence was Winnipeg (84%).

### Admission diagnoses

Each year, about 56 individuals were admitted to hospital, with 72% staying less than 10 days. The most common admission diagnosis was pneumonia (37% individuals), followed by soft tissue infection (9.6%) and sepsis (9.4%). Bacterial community-acquired pneumonia accounted for 55% of the pneumonia diagnoses, 42% were unclassified and 3% were reported as nosocomial infections. Among those with pneumonia, 78% stayed less than 10 days. Among those who did not have pneumonia, 69% stayed less than 10 days. A diagnosis of pneumonia was associated with 31% of all hospital days.

### Co-morbidities

Hepatitis C infection was the most common pre-existing co-morbidity, present among 46% of HIV-positive patients admitted to hospital, compared with 25% of newly enrolled

non-hospitalized Manitoba HIV Program patients (odds ratio = 3.12). The second and third most common pre-existing conditions were listed as chronic drug or alcohol use (36%). Other co-morbid conditions included chronic obstructive pulmonary disease (14%), diabetes mellitus (12%), vascular disease (6%) and cancer (5%).

### CD4 cell counts

The average and median CD4 counts were 219 and 150 cells/mm<sup>3</sup>, respectively (range 1–1204) at the time of admission to hospital. Among the 3.5% of patients who died in hospital, the average CD4 count was 133 cells/mm<sup>3</sup>. Two-thirds (67%) of admitted individuals were found to have CD4 cell counts below 350 cells/mm<sup>3</sup> and 66% of these patients with low CD4 counts were not on antiretroviral therapy at presentation. Extremely low CD4 cell counts (<50 cells/mm<sup>3</sup>) were identified in 28% of patients.

### DISCUSSION

Among HIV-positive individuals admitted to hospital in Winnipeg from October 2003 to May 2010, infectious diseases were the most commonly recorded reasons for admission, with pneumonia being the most common. In a study of 297 randomly selected adult men admitted to hospital in Winnipeg, 8% were diagnosed with pneumonia,<sup>4</sup> compared with 37% of the present sample. Previous studies have shown that hospitalized HIV-positive individuals with pneumonia have higher odds of a longer hospital stay and one-year mortality compared with hospitalized HIV-negative individuals with pneumonia.<sup>5</sup> Significant health-care costs are associated with these relatively long hospital stays.<sup>6</sup> Despite the fact that in our study pneumonia was found to be associated with relatively short hospital stays at the individual level, as pneumonia was the most frequent diagnosis, it does account for a large proportion of total hospital days. The reason for the relatively shorter hospital stays associated with pneumonia may have been the more serious nature of other admitting diagnoses.

A study of injection drug users across Canada estimated the HIV/HCV co-infection rate to be 11.7%.<sup>7</sup> Among newly enrolled Manitoba HIV Program patients, the co-infection rate is approximately 25%,<sup>3</sup> which is much lower than the 46% among the present hospitalized study sample. HIV/HCV co-infection is associated with higher rates of hospitalization, emergency department use, disability<sup>8</sup> and mortality<sup>9</sup> among hospitalized individuals compared with those with only HIV.

Of further concern are the low CD4 counts among HIV-positive patients admitted to hospital in Winnipeg. The association between low CD4 count and opportunistic infections, including opportunistic pneumonia, has long been established<sup>10</sup> and Canadian data indicate that hospitalization among HIV-positive individuals is associated with lower CD4

counts.<sup>11</sup> Further, a Canadian study determined that the mean cost for medical care was higher among patients with very low CD4 counts ( $\leq 75$  cells/mm<sup>3</sup>), and hospitalization accounted for most of this cost increase.<sup>6</sup>

Study limitations include the retrospective nature of the study, limited microbiological results and lack of comparative data.

This study highlights the tremendous burden of disease among this population. There is a need for earlier HIV diagnosis, HCV and pneumonia prevention and care with particular emphasis on injection drug users, and improved linkage to care and treatment.

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